Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

DoD Publications

DoD Manual 4270.1-M, *Construction Criteria Manual*

DoD Instruction 4165.57, *Air Installation Compatible Use Zone Program*

DoD Instruction 6050.1, *Environmental Effects in the United States of DoD Actions*

DoD Instruction 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*

DoD Standard 6055.9, *Ammunition and Explosives Safety Standards*

Air Force Publications

AFI 11-218, *Aircraft Operation and Movement on the Ground*

AFI 13-209, *Instrument Procedures*

AFI 13-203, *Air Traffic Control*

AFI 31-101, *The Physical Security Program*

AFI 31-209, *The Air Force Resource Protection Program*

AFI 32-1014, *Pavement Design for Airfields*

AFI 32-1024, *Standard Facility Requirements*

AFI 32-1042, *Standards for Marking Airfields*

AFI 32-1043, *Managing Aircraft Arresting Systems*

AFI 32-1044, *Visual Air Navigation Systems*

AFI 32-7061, *Environmental Impact Analysis Process*

AFI 32-7062, *Air Force Comprehensive Planning*

AFI 32-7063, *Air Installation Compatible Use Zone Program*

AFJMAN 11-226, *United States Standard for Terminal Instrument Procedures (TERPS)*

AFJMAN 32-8008, *General Provisions for Airfield/Heliport Pavement Design*

AFMAN 11-230, *Instrument Procedures*

AFMAN 32-1076, *Visual Air Navigation Facilities*

AFMAN 91-201, *Explosives Safety Standards*

AFM 88-5CH1, *Surface Drainage Facilities for Airfields and Heliports*

AFM 88-5CH2, *Drainage and Erosion Control Subsurface Drainage Facilities for Airfield Pavements*

AFM 88-5CH3, *Drainage and Erosion Control Structures for Airfields and Heliports*

AFM 88-6CH2, *Flexible Pavement Design for Airfields (Elastic Layered Method)*

AFM 88-6CH3, *Rigid Pavements for Airfields*

AFM 88-7, *General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas*

AFM 88-9CH3, *Electrical Design, Lightning and Static Electricity Protection*

AFM 88-11, *Sanitary and Industrial Wastewater Collection Gravity Sewers and Appurtenances*

AFJPAM 32-8013V2, *Planning and Design of Roads, Airfields and Heliports in the Theater of Operations*

AFP 88-71, *Design Guide for Army and Air Force Airfields, Pavements, Railroads, Storm Drainage, and Earthwork*

AFH 32-1084, *Facility Requirements Handbook*

ETL 94-01, *Standard Airfield Pavement Marking Schemes*

T.O. 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding*

MIL-HDBK-1008C, *Fire Protection for Facilities Engineering Design and Construction*

Army Publications

AR 50-51, *Nuclear Weapons Security* (Confidential)

AR 95-2, *Air Traffic Control, Air Space, Airfield Flight Facilities and Navigational Aids*

AR 95-9, *Terminal Air Navigation and Air Traffic Control Facilities*

AR 115-10, *Meteorological Support for the US Army*

AR 190-11, *Physical Security of Arms, Ammunition, and Explosives*

AR 200-2, *Environmental Effects of Army Actions*

AR 210-20, *Master Planning for Army Installations*

AR 310-49, *The Army Authorization Documents Systems (TAADS)*

AR 385-64, *Ammunition and Explosives Safety Standards*

AR 750-1, *Army Material Maintenance Policies and Retail Maintenance Operations*

TM 1-1500-250-23, *General Tie-Down and Mooring on all Series Army Models AH-64, UH-60, CH-47, UH-1, AH-1, OH-58 Helicopters*

TM 5-811-3, *Electrical Design, Lightning, and Static Electricity Protection*

TM 5-811-5, *Army Aviation Lighting*

TM 5-820-1, *Surface Drainage Facilities for Airfields and Heliports*

TM 5-820-2, *Drainage and Erosion Control Subsurface Drainage Facilities for Airfield Pavements*

TM 5-820-3, *Drainage and Erosion Control Structures for Airfields and Heliports*

TM 5-822-2, *General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas*

TM 5-822-5, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas*

TM 5-823-4, *Marking of Army Airfield-Heliport Operational and Maintenance Facilities*

TM 5-825-1, *General Provisions for Airfield/Heliport Pavement Design*

TM 5-825-2, *Flexible Pavement Design for Airfields*

TM 5-825-3, *Rigid Pavements for Airfields*

TM 95-226, *United States Standard for Terminal Instrument Procedures (TERPS)*

FM 11-486-23, *Telecommunications Engineering Air Traffic Control Facilities and Systems*

FM 101-20, *US Army Aviation Planning Manual*

FM 5-430-00-2, *Planning and Design of Roads, Airfields, and Heliports in the Theater of Operations*

DG-1110-3-204, *Design Guide for Army and Air Force Airfields, Pavements, Railroads, Storm Drainage, and Earthwork*

DA PAM 190-51, *Risk Analysis for Army Property*

TB 95-1, *US Army Air Traffic Control and NavAid Facility Standards*

Navy Publications

OPNAVINST 3722.16, *United States Standard for Terminal Instrument Procedures (TERPS)*

OPNAVINST 5090.1B, *Environmental and Natural Resources Program Manual*

OPNAVINST 5090.2, *Management of Ozone Depleting Substances*

OPNAVINST 5530.14B, *Department of the Navy, Physical Security and Loss Prevention*

OPNAVINST 11010.36A, *Air Installation Compatible Use Zone (AICUZ) Program*

MIL-HDBK-274, *Electrical Grounding for Aircraft Safety*

MIL-HDBK-1004/1, *Preliminary Design Considerations*

MIL-HDBK-1005/3, *Drainage Systems*

MIL-HDBK-1005/9, *Industrial and Oily Wastewater Control*

MIL-HDBK-1013/1, *Design Guidelines for Physical Security of Facilities*

MIL-HDBK-1013/10, *Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities*

MIL-HDBK-1021/1, *General Concepts for Airfield Pavement Design*

MIL-HDBK-1021/2, *General Concepts for Airfield Pavement Design*

MIL-HDBK-1021/4, *Rigid Pavement Design for Airfields*

MIL-HDBK-1022, *Petroleum Fuels Facilities*

MIL-HDBK-1023/1, *Airfield Lighting*

MIL-HDBK-1024/1, *Aviation Operational and Support Facilities*

MIL-HDBK-1028/1, *Aircraft Maintenance Facilities*

NAVAIR 16-1-529, *Electromagnetic Radiation Hazards*

NAVAIR 51-50AAA-2, *General Requirements for Shore Based Airfield Marking and Lighting*

NAVSEA OP-5, *Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation, and Shipping*

NAVFACINST 11010.44, *Shore Facilities Planning Manual*

NAVFACINST 11010.57, *Site Approval of Naval Shore Facilities*

DM 21.03, *Flexible Pavement Design for Airfields*

DM 21.06, *Airfield Pavement Design for Frost and Subsurface Drainage*

DM 22, *Petroleum Fuel Facilities*

P-80, *Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations*

P-80.3, *Airfield Safety Clearances*

P-272, *Definitive Designs for Navy and Marine Corps Facilities*

Federal Aviation Administration Advisory Circulars

AC 70/7460-1, *Obstruction Marking and Lighting*

AC 90-230, *Wake Turbulence*

AC 97-1, *Runway Visual Range*

AC 150/5060-5, *Airport Capacity and Delay*

AC 150/5220-9, *Aircraft Arresting Systems for Joint Civil/Military Airports*

AC 150/5220-13, *Runway Surface Condition Sensor Specification Guide*

AC 150/5220-16, *Automated Weather Observing Systems (AWOS) for Non-Federal Applications*

AC 150/5300-13, *Airport Design*

AC 150/5320-5, *Airport Drainage*

AC 150/5320-6, *Airport Pavement Design and Evaluation*

AC 150/5340-1, *Marking of Paved Areas on Airports*

AC 150/5340-4, *Installation Details for Runway Centerline Touchdown Zone Lighting Systems*

AC 150/5340-14, *Economy Approach Lighting Aids*

AC 150/5340-17, *Standby Power for Non-FAA Airport Lighting Systems*

AC 150/5340-18, *Standards for Airport Sign Systems*

AC 150/5340-19, *Taxiway Centerline Lighting Systems.*

AC 150/5340-21, *Airport Miscellaneous Lighting Visual Aids*

AC 150/5340-23, *Supplemental Wind Cones*

AC 150/5340-24, *Runway and Taxiway Edge Lighting Systems*

AC 150/5345-12, *Specification for Airport and Heliport Beacon*

AC 150/5345-27, *Specification for Wind Cone Assemblies*

AC 150/5345-28, *Precision Approach Path Indicator (PAPI)*

AC 150/5345-43, *Specification for Obstruction Lighting Equipment*

AC 150/5345-44, *Specification for Taxiway and Runway Signs*

AC 150/5345-46, *Specification for Runway and Taxiway Light Fixtures*

AC 150/5390-2, *Heliport Design*

Federal Aviation Regulations

FAR Part 77, *Objects Affecting Navigable Air Space*

Orders

6310.13, *Airport Surveillance Radar (ASR) Site Construction*

6480.4, *Airport Traffic Control Tower Siting Criteria*

6560.20, *Siting Criteria for Automated Weather Observing System (AWOS)*

6750.16, *Siting Criteria for Instrument Landing Systems*

6820.10, *VOR, VOR/DME and VORTAC Siting Criteria*

6850.11, *Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)*

6850.2, *Visual Guidance Lighting Systems*

6850.8A, *Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)*

6850.21, *Omnidirectional Approach lighting System (ODALS)*

6850.24, *Runway End Identifier Lighting System*

6850.28, *Precision Approach Path Indicator Project Implementation Plan*

7031.2, *Airway Planning Standard Number One Terminal Air Navigation Facilities and ATC Services*

8260.38, *Civil Utilization of Global Positioning System (GPS)*

National Fire Protection Association

NFPA Standard 415, *Aircraft Fueling Ramp Drainage*

NFPA Standard 780, *Standards for the Installation of Lightning Protection Systems*

Illuminating Engineering Society of North America

IES-RP-14-1987, *IES Recommended Practice for Airport Service Area Lighting*

Institute of Electrical and Electronic Engineers (IEEE) Standards

IEEE Standard 142, *Recommended Practice for Grounding of Industrial and Commercial Power Systems*

Abbreviations and Acronyms

AC—advisory circular

a.c.—alternating current

AFCESA—Air Force Civil Engineer Support Agency

AFFSA—Air Force Flight Standards Agency

AFH—Air Force Handbook

AFI—Air Force Instruction

AFJMAN—Air Force Joint Manual

AFJPAM—Air Force Joint Pamphlet

AFM—Air Force Manual

AFMAN—Air Force Manual

AFPD—Air Force Policy Directive

AFR—Air Force Regulation

AICUZ—Air Installation Compatibility Use Zone

ALSF1—High Intensity ALS with Sequenced Flashing Lights

ALSF2—High Intensity ALS with Sequenced Flashing Lights

ALS—Approach Lighting System

AMSL—above mean sea level

ANG—Air National Guard

APOE—Aerial Ports of Embarkation

APOD—Aerial Ports of Debarkation

APZ I—Accident Potential Zone I

APZ II—Accident Potential Zone II

AR—Army Regulation

ASOS—Automatic Surface Observation Station

ASR—Airport Surveillance Radar

ASV—Annual Service Volume

ATC—Air Traffic Control

ATCALS—Air Traffic Control and Landing Systems

ATCT—Air Traffic Control Tower

AVGAS—aviation gasoline

AVIM—Aviation Intermediate Maintenance

AVUM—Aviation Unit Maintenance

AWOS—Automated Weather Observation Station

BAK—Barrier, Arresting Kit

CAT I ILS—Category I Instrument Landing System

CAT II ILS—Category II Instrument Landing System

CCP—Compass Calibration Pad

CoE—Corps of Engineers

COE TSMCX—Corps of Engineers Transportation Systems Mandatory Center of Expertise

CX—categorical exclusion

DA—Department of the Army

DA PAM—Department of the Army Pamphlet

d.c.—direct current

DH—decision height

DIA—diameter

DM—Design Manual

DME—Distance Measuring Equipment

DoD—Department of Defense

EA—Environmental Assessment

EED—Electroexplosive Device

EIS—Environmental Impact Statement

EMI—electromagnetic interference

ES—explosive sites

ETL—Engineering Technical Letter

FAA—Federal Aviation Administration

FM—Field Manual (US Army)

FONSI—Finding of No Significant Impact

FOD—foreign object damage

FSSZ—Fuel Servicing Safety Zone

GCA—Ground Control Approach

GPI—Ground Point of Intercept

GPS—Global Positioning System

HIRL—High Intensity Runway Edge Lights

HNM—Helicopter Noise Model

ICAO—International Civil Aviation Organization

ICUZ—Installation Compatible Use Zone

IEEE—Institute of Electrical and Electronic Engineers

IES—Illuminating Engineering Society of North America

IFR—Instrument Flight Rules

ILS—Instrument Landing System

IM—Inner Marker

IMC—Instrument Meteorological Conditions

LANTDIV—Atlantic Division of the Naval Facilities Engineering Command

LDIN—Leadin Lighting System

MACOM—Major Command (US Army)

MAJCOM—Major Command (USAF)

MALS—Medium Intensity Approach Lighting System

MALSF—Medium Approach Light System with Sequenced Flashers

MALSR—Medium Approach Light System with Runway Alignment Indicator Lights

MATCT—Mobile Air Traffic Control Tower

max—maximum

MDA—Minimum Descent Altitude

METNAV—Meteorological NAVAIDS Detachment

MILHDBK—Military Handbook

min—minimum

MIRL—Medium Intensity Runway Edge Lights

MLS—Microwave Landing System

MM—Middle Marker

MMLS—Mobile Microwave Landing System

MSL—mean sea level

MTI—Moving Target Indicator

NA—not applicable

NAD83—North American Datum of 1983

NATO—North Atlantic Treaty Organization

NAVAID or NavAIDS—Navigational Aids

NAVAIR—Naval Air Systems Command

NAVFAC—Naval Facilities Engineering Command

NAVFACINST—Naval Facilities Engineering Command Instruction

NAVFAC P—Naval Facilities Engineering Command Publication

NAVFACENGCOM—Naval Facilities Engineering Command

NAVFIG—Naval Flight Information Group

NAVSEA OP—Naval Sea Operations Command Operating Instruction

NDB—non directional beacon

NEPA—National Environmental Policy Act

NFPA—National Fire Protection Association

NM—nautical mile (1,852 m) (6,076 feet)

NTS—not to scale

ODALS—Omnidirectional Approach Lighting System

OLS—Optical Landing System

OM—outer marker

OPNAVINST—Operations Naval Instruction

PAPI—Precision Approach Path Indicator

PAR—Precision Approach Radar

PES—Potential Explosive Site

PI—Point of Intersection

Q-D—QuantityDistance

RAIL—Runway Alignment Indicator Lights

RAPCON—Radar Approach Control

REIL—Runway End Identifier Lights

RF—Radio Frequency

ROD—Record of Decision

RSU—Runway Supervisory Unit

RSZ—Refueling Safety Zone

RVR—Runway Visual Range

RWOS—Representative Weather Observation Station

SALS—Short Approach Lighting System

SFA—Support Facility Annexes

SM—statute mile (1,609 m) (5,280 feet)

SOI—Statement of Intent

SPR—Single Point Receptacle

SSALR—Simplified Short Approach Light System with Runway Alignment Indicator Lights

STANAG—Standardization Agreement

TACAN—Tactical Air Navigation

TCH—Threshold Crossing Height

TERPS—Terminal Instrument Procedures

TM—Technical Manual

TOE—Tables of Organization and Equipment

TVOR—Terminal Very High Frequency Omnidirectional Range

USAASA—US Army Aeronautical Services Agency

USAATCA—US Army Air Traffic Control Activity

USAF—United States Air Force

VASI—Visual Approach Slope Indicator

VIP—Very Important Person

VFR—Visual Flight Rules

VMC—Visual Meteorological Conditions

VOR—Very High Frequency Omnidirectional Range (Radio)

VORTAC—Very High Frequency Omnidirectional Range (Radio) and Tactical Air Navigation

VSTOL—Vertical Short Takeoff and Landing

VTOL—Vertical Takeoff and Landing

WGS84—World Geodetic System 1984

Terms

Aborted Takeoff—An unsuccessful takeoff operation due to power or other mechanical failures.

Accident Potential Zone I (APZ I)—The area beyond the clear zone that possesses a significant potential for accidents.

Accident Potential Zone II (APZ II)—The area beyond APZ I that has a measurable potential for accidents.

AICUZ (Air Installation Compatible Use Zone)—A DoD program designed to promote compatible development around military airfields and to protect the integrity of the installation's flying mission.

Air Traffic—Aircraft in operation anywhere in the airspace and within that area of an airfield or airport normally used for the movement of aircraft.

Aircraft—Fixed-wing (F/W) (Airplane) and rotary-wing (R/W) (helicopter).

Aircraft, Class A—Aircraft listed under Class A Runways in Table 3.1 of this manual.

Aircraft, Class B—Aircraft listed under Class B Runways in Table 3.1 of this manual.

Aircraft Arresting Barrier—A device, not dependent on an aircraft hook, used to engage and absorb the forward momentum of an emergency landing or an aborted takeoff.

Aircraft Arresting Cable—That part of an aircraft arresting system which spans the runway surface or flight deck landing area and is engaged by the aircraft arresting gear.

Aircraft Arresting Complex—An airfield layout comprised of one or more arresting systems.

Aircraft Arresting Gear—A device used to engage hook-equipped aircraft to absorb the forward momentum of a routine or emergency landing or aborted takeoff.

Aircraft Arresting System—A series of components used to engage and absorb the forward momentum of a routine or emergency landing or an aborted takeoff.

Aircraft Wash Area—A specially designed paved area for washing and cleaning aircraft.

Aircraft Wash Rack—Paved areas provided at all facilities to clean aircraft in conjunction with periodic maintenance.

Aircraft Rinse Facility—Paved areas provided at facilities to clean aircraft returning from flight and en route to the parking area.

Airfield—An area prepared for the accommodation (including any buildings, installations, and equipment), of landing and takeoff of aircraft.

Airfield Elevation—The established elevation, in terms of the nearest 300 mm (one foot) above mean sea level, of the highest point of the usable landing area.

Airfield Reference Point—The designated geographical location of an airfield. It is given in terms of the nearest second of latitude and longitude. The position of the reference point must be as near to the geometric center of the landing area as possible, taking future development of the airfield into account.

Airport—Refers to a civil or municipal airfield.

Airside Facilities—Facilities associated with the movement and parking of aircraft. These include runways, taxiways, apron areas, associated navigational aids and imaginary surfaces.

Airspace—The space above ground or water areas which is or is not controlled, assigned, and/or designated.

Alert Aircraft Parking—An exclusive paved area for armed aircraft to park and have immediate, unimpeded access to a runway.

Alert Pad—Small paved areas provided for single alert aircraft parking.

Approach Control—A service established to control flights, operating under instrument flight rules (IFR), arriving at, departing from, and operating in the vicinity of airports by direct communication between approach control personnel and aircraft operating under their control.

Approach-Departure Clearance Surface—An inclined plane or combined inclined and horizontal planes arranged symmetrically about the runway centerline extended. The first segment or the beginning of the inclined plane is coincident with the ends and edges of the primary surface, and the elevation of the centerline at the runway end. This surface flares outward and upward from these points.

Apron—A defined area, on an airfield, intended to accommodate aircraft for the purposes of loading or unloading passengers or cargo, refueling, parking or maintenance.

Apron, Aircraft Access—See Apron, Hangar Access.

Apron, Alert—A designated area for multiple alert aircraft parking.

Apron Edge—See Edge of Apron.

Apron, Hangar Access—Hangar access aprons are paved areas connecting hangars with adjacent aircraft aprons.

Apron, Holding (Engine Run up Area)—A paved area adjacent to the taxiway near the runway ends where final preflight warmup and engine and instrument checks are performed.

Apron, Parking—A parking apron is a designated paved area on an airfield intended to accommodate fixed-and rotary-wing aircraft for parking.

Arming and Disarming—The loading and unloading of missiles, rockets, and ammunition in aircraft.

Arrestment Capable Aircraft—An aircraft whose flight manual specifies arrestment procedures.

Autorotation Lane—A helicopter landing lane or designated area on a runway used for practicing landings under simulated engine failure or certain other emergency conditions. Also known as a slide area when designed specifically for USAF skid-type helicopters.

Aviation Facility—The combination of land, airspace, pavements and buildings which are needed to support an aviation movement or action. An aviation facility can be an airfield, heliport, or helipad. The aviation facility includes "airside" and "landside" facilities.

Aviation Intermediate Maintenance (AVIM)—For Army, units that provide mobile, responsive "one-stop" maintenance and repair of equipment to return to user.

Aviation Movement or Action—An aviation movement or action includes but is not limited to: the landing and take-off of aircraft; readiness of aircraft; flight training of pilots; loading and unloading of aircraft; and the maintenance and fueling of aircraft.

Aviation Unit Maintenance (AVUM)—For Army, activities staffed and equipped to perform high frequency "on aircraft" maintenance tasks required to retain or return aircraft to a serviceable condition.

Avigation Easement—A legal right obtained from a property owner to operate aircraft over that property and to restrict the height of any construction or growth on that property.

Beam Wind Component—The wind velocities perpendicular to the axis of the runway centerline used to measure the degree by which a runway pattern covers incident wind.

Blast Protective Area—An area protected by pavement construction at the ends of runways and taxiways against jet blast erosion.

Circling Approach Area—The area in which aircraft circle to land under visual conditions.

Clear Zone—A surface on the ground or water beginning at the runway end and symmetrical about the runway centerline extended.

Compass Calibration Pad—An aircraft compass calibration pad is a paved area in an electromagnetically quiet zone where an aircraft's compass is calibrated.

Compass Rose—A graduated circle, usually marked in degrees, indicating directions and printed or inscribed on an appropriate medium.

Conical Surface—An imaginary surface that extends from the periphery of the inner horizontal surface outward and upward at a slope of 20 horizontal to one for a horizontal distance of 2,133.6 m (7,000 ft) to a height, 152.4 m (500 ft) above the established airfield elevation. The conical surface connects the inner horizontal surface with the outer horizontal surface. It applies to fixed-wing installations only.

Controlling Obstacle—The highest obstacle relative to a prescribed plane within a specified area. In precision and non-precision approach procedures where obstacles penetrate the approach surface, the controlling obstacle is the one which results in the requirement for the highest Decision Height (DH) or Minimum Descent Altitude (MDA).

Crosswind Runway—A secondary runway that is required when the primary runway orientation does not meet crosswind criteria (see Appendix D).

Decision Height—A height above the highest elevation in the touchdown zone, specified for a precision approach, at which a missed approach procedure must be initiated if the required visual reference has not been established.

Displaced Threshold—A runway threshold that is not at the beginning of the full-strength runway pavement.

Edge of Apron—The boundary of an apron, marked by painted stripe in accordance with pavement marking manual.

Fixed-Wing Aircraft—A powered aircraft that has wings attached to the fuselage so that they are either rigidly fixed or swing-wing, as distinguished from aircraft with rotating wings, like a helicopter.

Flight Path—The line connecting the successive positions occupied, or to be occupied, by an aircraft, missile, or space vehicle as it moves through air or space.

Fuel Servicing Safety Zone (FSSZ)—The FSSZ is the area required for safety around pressurized fuel carrying servicing components; i.e. servicing hose, fuel nozzle, single point receptacle (SPR), hydrant hose car, ramp hydrant connection point, etc. and around aircraft fuel vent outlets. The fuel servicing safety zone is established and maintained during pressurization and movement of fuel.

Full Stop Landing—The touchdown, rollout, and complete stopping of an aircraft to zero speed on runway pavement.

Grade—Also Gradient—A slope expressed in percent. For example, a 0.5 percent grade means a 0.5 meter [foot] slope in 100 meters [feet].

Ground Point of Intercept (GPI)—A point in the vertical plane of the runway centerline or center of a helipad at which it is assumed that the straight line extension of the glide slope (flight path) intercepts the approach surface base line (TM 95-226).

Hardstand—See Apron.

Helicopter—An aircraft deriving primarily elements of aerodynamic lift, thrust and control from one or more power driven rotors rotating on a substantially vertical axis.

Helicopter(Small)—OH, UH and AH helicopters with a gross weight of 5,670 kg [12,500 pounds] or less.

Helicopter Parking Space, Type 1 (Army Only)—In this configuration, rotary-wing aircraft are parked in a single lane, which is perpendicular to the taxilane.

Helicopter Parking Space, Type 2 (Army Only)—In this configuration, rotary-wing aircraft are parked in a double lane, which is parallel to the taxilane.

Helicopter Runway—A prepared surface used for the landing and takeoff of helicopters requiring a ground run.

Helipad—A prepared area designated and used for takeoff and landing of helicopters (includes touchdown and hoverpoint.)

Heliport—A facility designed for the exclusive operating, basing, servicing and maintaining of rotary-wing aircraft (helicopters). The facility may contain a rotary-wing runway and/or helipads.

Heliport or Helipad Elevation—The established elevation, in terms of the nearest 300 mm (one foot) above mean sea level, based on the highest point of the usable landing area.

High-Speed Taxiway Turnoff—A taxiway leading from a runway at an angle which allows landing aircraft to leave a runway at a high speed.

Holding Position—A specified location on the airfield, close to the active runway and identified by visual means, at which the position of a taxiing aircraft is maintained in accordance with air traffic control instructions.

Horizontal Surfaces, Fixed-Wing:

Inner Horizontal Surface—An imaginary plane 45.72 m (150 ft) above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius 2,286.0 m (7,500 ft) from the centerline of each runway end, and interconnecting those arcs with tangents.

Outer Horizontal Surface—An imaginary plane 152.4 m (500 ft) above the established airfield elevation extending outward from the outer periphery of the conical surface for a horizontal distance of 9,144.0 m (30,000 ft).

Horizontal Surface, Rotary-Wing—An imaginary plane at 45.72 m (150 ft) above the established heliport or helipad elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing an arc with a radius of 1,402 m (4,600 ft) at the end of each runway, and connecting the arcs with tangents, or by scribing the arc about the center of the helipad.

Hover—A term applied to helicopter flight when the aircraft: (1) maintains a constant position over a selected point (1 m to 3 m [3 ft to 10 ft] above ground), and (2) is taxiing (airborne) (1 m to 3 m [3 ft to 10 ft] above ground) from one point to another.

Hoverlane—A designated aerial traffic lane for the directed movement of helicopters between a helipad or hoverpoint and the servicing and parking areas of the heliport or airfield.

Hoverpoint—A prepared and marked surface at a heliport or airfield used as a reference or central point for arriving or departing helicopters.

IFR Helipad—A helipad designed for Instrument Flight Rules. IFR design standards are used when an instrument approach capability is essential to the mission and no other instrument landing facilities, either fixed-wing or rotary-wing, are located within an acceptable commuting distance to the site.

Imaginary Surfaces. Surfaces in space established around airfields in relation to runway(s), helipad(s), or helicopter runway(s) that are designed to define the obstacle free airspace around the airfield. The imaginary surfaces for DoD airfields are the primary surface, the approach-departure clearance surface, the transitional surface, the inner horizontal surface, the conical surface (fixed-wing only), and the outer horizontal surface (fixed-wing only).

Ingress/Egress, Same Direction—One approach-departure route to and from the helipad exists. The direction from which the rotary-wing aircraft approaches the helipad (ingress) is the only direction which the rotary-wing aircraft departs (egress) from the helipad. Typically, the helipad is surrounded by obstacles on three sides which make approaches from other directions impossible. For example, if the rotary-wing aircraft approaches from the southwest, it must also depart to the southwest.

Ingress/Egress, Two Direction—Rotary-wing aircraft can approach and depart the helipad from two directions (one direction and the opposite direction). (See also Ingress/Egress, Same Direction.)

Instrument Runway—A runway equipped with electronic navigation aids for which a precision or non-precision approach procedure is approved.

Instrument Flight Rules (IFR)—Rules that govern the procedure for conducting instrument flight. Also see Instrument Meteorological Conditions.

Instrument Landing System—A system of ground equipment designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. The ground equipment consists of two highly directional transmitting systems and, along the approach, three (or fewer) marker beacons. The directional transmitters are known as the localizer and glide slope transmitters.

Instrument Meteorological Conditions—Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling; less than minimums specified for visual meteorological conditions.

Intermediate Area—The area between runways and between runways and taxiways that is graded or cleared for operational safety.

Joint/Shared Use Airfield—Those airports that are shared by a civilian DoD agency covered under the "Airports and Airway Improvement ACT of 1982 (Public LAW 97-248, Sep 3, 1982, 49 USC, APP 2201.) Only those facilities (i.e., runways/taxiways) that are used by both civilian and DoD agencies are considered "Shared/Joint Use." All other facilities (parking ramps, hangars, terminals, and so forth) are the sole property of the using agency. A US Air Force installation where agreements exist among the Air Force, civil, and host nation authorities for joint use of all or a portion of airfield facilities.
Landing Area—See Take-Off and Landing Area.

Landing Field—Any area of land consisting of one or more landing strips, including the intermediate area, that is designed for the safe takeoff and landing of aircraft.

Landing Lane—A defined lane on the airfield used for simultaneous takeoff and landings of multiple (up to four at one time) helicopters. Landing lanes are used at airfields or heliports when a high density of helicopters are parked on an apron, or in the process of takeoff and landings.

Landing Rollout—Distances covered in stopping the aircraft, when loaded to maximum landing weight, following touchdown using standard operation and braking procedures on a hard, dry-surfaced, level runway with no wind.

Landing Strip—That portion of an airfield that includes the landing area, the end zones, and the shoulder areas. Also known as a flight strip.

Landside Facilities—Landside facilities are facilities not associated with the movement and parking of aircraft but are required for the facilities' mission. These include aircraft maintenance areas, aviation support areas, fuel storage and dispensing, explosives and munitions areas and vehicular needs.

Large Transport Aircraft—A transport aircraft with a wing span of 33.5 m [110 ft] or greater.

Light Bar—A set of lights arranged in a row perpendicular to the light system centerline.

Limited Use Helipad—Helipad, limited to small helicopters 5,670 kg (12,500 lbs) or less, for low density VFR operations only, i.e., occasional operations at special locations such as hospitals or involving only small helicopters (OH, UH, AH type).

Line Vehicle—Any vehicle used on the landing strip, such as a crash fire truck or tow tractor.

Localizer—A directional radio beacon which provides to an aircraft an indication of its lateral position relative to a predetermined final approach course.

Localizer Type Directional Aid (LDA)—A NAVAID used for nonprecision instrument approaches with utility and accuracy comparable to a localizer but which is not part of a complete ILS. The LDA is not aligned with the runway, but may be aligned within 3 degrees (3°) of the runway centerline.

Magnetic North—The direction indicated by the north-seeking pole of a freely suspended magnetic needle, influenced only by the earth's magnetic field.

Magnetic Variation—At a given place and time, the horizontal angle between the true north and magnetic north measured east or west according to whether magnetic north lies east or west of true north.

Magnetically Quiet Zone—A location where magnetic equipment, such as a compass, is only affected by the earth's magnetic forces.

Non-Precision Approach—An approach flown by reference to electronic navigation aids in which glide slope information is not available.

Non-Instrument Runway—A runway intended for operating aircraft that under visual flight rules.

Obstacle—An existing object, natural growth, or terrain, at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operations.

Obstacle Clearance—The vertical distance between the lowest authorized flight altitude and a prescribed surface within a specified area.

Obstruction—A natural or man-made object that violates airfield or heliport clearances, or projects into imaginary airspace surfaces. Navy and Marine Corps see NAVFAC P-80.3.

Overrun Area—An area the width of the runway plus paved shoulders extending from the end of the runway to the outer limit of the end zone. This portion is a prolongation of the runway which is the stabilized area.

Parking, Aircraft Undergoing Maintenance—Apron parking space is provided for parking aircraft which must undergo maintenance.

Parking, Alert Aircraft—Parking for aircraft that must be in flight upon short notice.

Parking, Operational Aircraft—Parking for operational aircraft assigned to a particular installation.

Parking, Transient Aircraft—Parking for transient aircraft (non-operational) at the installation, but not assigned there.

Parking, Transport Aircraft—Parking for transport aircraft carrying cargo and personnel which must be loaded and unloaded.

Pavement (Paved Surface)—A durable weather and abrasion resistant surface made from a prepared or manufactured material placed on an established base. General categories of pavements are flexible and rigid.

Power Check—The full power test of an aircraft engine while the aircraft is held stationary.

Power Check Pad—An aircraft power check pad is a paved area, with an anchor block in the center, used to perform full-power engine diagnostic testing of aircraft engines while the aircraft is held stationary.

Precision Approach—An approach in which azimuth and glide slope information are provided to the pilot.

Primary Surface (Fixed-Wing Runways)—An imaginary surface symmetrically centered on the runway, extending 60.96 m (200 ft) beyond each runway end. The width varies depending upon the class of runway and coincides with the lateral clearance distance. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

Primary Surface (Rotary-Wing Runways and Landing Lanes)—An imaginary surface symmetrically centered on the runway, extending beyond the runway ends. The width and length depends upon whether the runway/landing lane is to accommodate VFR or IFR operations. The lateral clearance distance coincides with the width of the primary surface. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

Runway—A defined rectangular area of an airfield or heliport prepared for the landing and takeoff run of aircraft along its length.

Runway (Class A)—Class A runways are primarily intended for small light aircraft. Ordinarily, these runways have less than 10 percent of their operations involving aircraft in the Class B category. These runways are normally less than 2,440 m (8,000 ft).

Runway (Class B)—Class B runways are all fixed-wing runways that accommodate normal operations of Class B Aircraft.

Runway End—As used in this manual, the runway end is where the normal threshold is located. When the runway has a displaced threshold, the using service will evaluate each individual situation and, based on this evaluation, will determine the point of beginning for runway and airspace imaginary surfaces.

Runway Exit—A taxiway pavement provided for turnoffs from the runway to a taxiway either at normal or high speed.

Runway, Parallel—Two or more runways at the same airport whose centerlines are parallel. In addition to runway number, parallel runways are designated as L (left) and R (right) or, if three parallel runways exist, L (left), C (center), and R (right).

Runway, Rotary-wing— A runway for rolling landings and take-off of rotary-wing aircraft. The rotary-wing runway allows for a helicopter to quickly land and roll to a stop compared to the hovering stop used during a vertical helipad approach.

Runway Threshold—A line perpendicular to the runway centerline designating the beginning of that portion of a runway usable for landing.

Runway Visual Range—The maximum distance in the direction of take-off or landing from which the runway, or the specified lights or markers delineating it, can be seen from a position above a specified point on its centerline at a height corresponding to the average eye-level of pilots at touchdown.

Service Point—A receptacle, embedded in certain airfield pavements, containing outlets for utilities required to service aircraft.

Shoulder—A prepared (paved or unpaved) area adjacent to the edge of an operational pavement.

Slide Area, Helicopter—A specially prepared but usually unpaved area used for practicing helicopter landings under simulated engine failure or certain other emergency conditions. VFR Helicopter runway criteria apply to these type facilities. (Also known as a Skid Pad.)

Slope Ratio—A slope expressed in meters [feet] as a ratio of the horizontal to the vertical distance. For example, 50:1 means 50 meters horizontal to 1 meter vertical [50 feet horizontal to 1 foot vertical].

Standard VFR Helipad—A helipad designed to Visual Flight Rules (VFR). VFR design standards are used when no requirement exists or will exist in the future for an IFR helipad.

Standby Parking Pad—At individual helipad sites where it is necessary to have one or more helicopters on standby, an area adjacent to the helipad, but clear of the landing approach and transitional surfaces.

Suppressed Power Check Pad—A suppressed power check pad is an enclosed power check pad, referred to as a "hush house," where full power checks of jet engines are performed.

Takeoff and Landing Area—A specially prepared or selected surface of land, water, or deck designated or used for takeoff and landing of aircraft.

Takeoff Safety Zone—A clear graded area within the approach-departure zone of all VFR rotary-wing facilities. The land use of this area is comparable to the clear zone area applied to fixed-wing facilities.

Taxilane—A designated path marked through parking, maintenance or hangar aprons, or on the perimeter of such aprons to permit the safe ground movement of aircraft operating under their own power.

Taxilane, Interior—A taxilane which provides a secondary taxi route to individual parking positions or a hangar and is not intended or used as a primary taxi route for through traffic.

Taxilane, Peripheral—A taxilane located along the periphery of an apron and intended as a primary taxi route.

Taxilane, Through—A taxilane providing a route through or across an apron which is intended as a primary taxi route for access to other taxilanes, aprons, taxiways or the runway.

Taxiway—A specially prepared or designated path, on an airfield or heliport other than apron areas, on which aircraft move under their own power to and from landing, service and parking areas.

Taxiway, Apron Entrance—A taxiway which connects a parallel taxiway and an apron.

Taxiway, End Turnoff (Entrance Taxiway) (Connecting Taxiway) (Crossover Taxiway)—A taxiway located at the end of the runway that serves as both an access and departure location for aircraft at the runway thresholds.

Taxiway, High-Speed Turnoff (High-Speed Exit) (Acute-angled Exit Taxiway)—A taxiway located intermediate of the ends of the runway and "acute" to the runway centerline to enhance airport capacity by allowing aircraft to exit the runways at a faster speed than normal turnoff taxiways allow. Aircraft turning off runways at high speeds (maximum 100 kmph [55 knots]) require sufficient length for a high-speed turnoff taxiway to decelerate to a full stop before reaching the parallel taxiway.

Taxiway, Normal Turnoff (Ladder Taxiway) (Intermediate Taxiway) (Exit Taxiway)—A taxiway located intermediate of the end of the runway, typically perpendicular to the runway centerline that allows landing aircraft to exit and clear runways as soon as possible.

Taxiway, Parallel—A taxiway which parallels the runway. The curved connections to the end of the runway permit aircraft ground movement to and from the runway and are considered part of the parallel taxiway when there are no other taxiway exits on the runway.

Taxiway Turnoff—A taxiway leading from a runway to allow landing aircraft to exit and clear the runway after completing their initial landing roll.

Threshold Crossing Height—The height of the straight line extension of the guide slope above the runway at the threshold.

Tiedown Anchor—A device, installed in certain airfield pavements, to which lines tying down an aircraft are secured. Grounding may be provided.

Touchdown Point—A designated location on a landing lane, taxiway, or runway for permitting more rapid launch or recovery of helicopters in a high density area.

Towway—A paved surface over which an aircraft is towed.

Transitional Surface— An imaginary surface that extends outward and upward at right angles to the runway centerline and the runway centerline extended at a slope ratio of 7H:1V. The transitional surface connects the primary and the approach departure clearance surfaces to the inner horizontal, the conical, and the outer horizontal surfaces.

Transitional Surfaces (Rotary-Wing)—The imaginary plane which connect the primary surface and the approach-departure clearance surface to the horizontal surface, or extends to a prescribed horizontal distance beyond the limits of the horizontal surface. Each surface extends outward and upward at a specified slope measured perpendicular to the runway centerline or helipad longitudinal centerline (or centerlines) extended.

True North—The direction from an observer's position to the geographic North Pole. The north direction of any geographic meridian.

Unsuppressed Power Check Pad—A power check pad without an enclosure or other type of noise suppressor. It is generally used as a back up or interim facility to a suppressed power check pad. The unsuppressed power check pad, in its simplest form, is a paved area on which full power engine diagnostic testing can be performed without noise or jet blast limitations.

Visual Flight Rules (VFR)—Rules that govern the procedures for conducting flight under visual conditions. Also see Visual Meteorological Conditions.

Visual Meteorological Conditions (VMC)—Weather conditions in which visual flight rules apply; expressed in terms of visibility, ceiling height, and aircraft clearance from clouds along the path of flight. When these criteria do not exist, instrument meteorological conditions prevail and instrument flight rules must be complied with. Also see Visual Flight Rules.

Vertical Sight Distance—The longitudinal distance visible from one location to another. Usually, a height above the pavement surface is also defined.

V-STOL—A tilt-rotor Vertical Take-Off and Landing Aircraft, that has the ability to operate as either a fixed- or rotary-wing aircraft.

Wind Rose—A diagram showing the relative frequency and strength of the wind in correlation with a runway configuration and in reference to true north. It provides a graphic analysis to obtain the total wind coverage for any runway direction.

Wind Direction—The direction from which the wind is blowing in reference to true north.